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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,719	01/04/2007	Masahiro Sasaura	14321.91	9542

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EXAMINER	
HITESHEW, FELISA CARLA	
ART UNIT	**PAPER NUMBER**
1792	
MAIL DATE	**DELIVERY MODE**
07/17/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,719	SASAURA ET AL.	
	Examiner	Art Unit	
	Felisa C. Hiteshew	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-9,11 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-9,11 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/23/2007 & 4/28/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The PTOL 1449s of 03/23/2007 and 04/28/2009 have been received, reviewed and considered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 6- 8 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Publication No. 05-024965 B2 (Shibata, et al).

Shibata, et al '965 teaches an apparatus for producing a semiconductor crystal using the VGF (vertical growth freeze) method of solidifying a melt gradually from below to above. The apparatus has a seed crystal disposing part (3a) at the bottom end, a crucible (3) housing the semiconductor melt (7), a heater (5) for heating the melt which forms such a temperature gradient that the temperature is lower in the lower part than in the upper part on the outer side of crucible (3), a cooling path (11) within a crucible supporting base (4) so as to enclose the circumference of the seed crystal. Growth is executed while cooling water is kept passed in the water path. The single crystal which

is complete in the crystal from the seed crystal to the terminal part of the crystal is obtained. The solid-liquid boundary shape (15) of the crystal is confirmed to be the projecting shape over the entire area of the crystal.

The difference being that JP '965 B2 does not teach an apparatus for producing crystals, wherein a cap is divided in multiple caps with temperature controlling means for regulating independently refrigerant flow running through each hollow portions of multiple caps, wherein the cap includes a heater and a temperature controlling means to a heater with the refrigerant flow regulation, wherein the pipe is divided into multiple pipes.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3, 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Japanese Publication No. 05-024965 B2 (Shibata, et al) in view of U.S. Patent No. 6, 670, 160 B2 (Kubo, et al).

Shibata, et al '965 teaches an apparatus for producing a semiconductor crystal using the VGF (vertical growth freeze) method of solidifying a melt gradually from below to above. The apparatus has a seed crystal disposing part (3a) at the bottom end, a crucible (3) housing the semiconductor melt (7), a heater (5) for heating the melt which forms such a temperature gradient that the temperature is lower in the lower part than in the upper part on the outer side of crucible (3), a cooling path (11) within a crucible supporting base (4) so as to enclose the circumference of the seed crystal. Growth is executed while cooling water is kept passed in the water path. The single crystal which is complete in the crystal from the seed crystal to the terminal part of the crystal is obtained. The solid-liquid boundary shape (15) of the crystal is confirmed to be the projecting shape over the entire area of the crystal.

The difference being that JP '965 B2 does not teach an apparatus for producing crystals, wherein a cap is divided in multiple caps with temperature controlling means for regulating independently refrigerant flow running through each hollow portions of multiple caps, wherein the cap includes a heater and a temperature controlling means to a heater with the refrigerant flow regulation, wherein the pipe is divided into multiple pipes.

Kubo, et al '160 B2 teaches a crystal growing apparatus for producing single crystals wherein a tubular cooler (10) is made from a metal which is forcedly cooled by

passing water. Preferable metal is copper based metal containing copper with high thermal conductivity as a base. The cooler is combined with a heat shield and arranged therein. Combination facilitates cooling of the crystal, and also more effectively restrains an increase in temperature of the cooler itself to promote an increased pulling rate. (See column 1, lines 43-51; column 2, lines 61-68, and column 3, lines 1-4. respectively) A controller (16) is utilized to determine flow rates measured by flow meters (14a, 14b), the opening and closing of valves (15a, 15b) along with controlling the water supply to the cooler (10). It would have been obvious to one of ordinary skill in the art to modify and optimize the apparatus, as taught by Shibata, et al '965 with the apparatus, as taught by Kubo, et al 169 B2. The motivation being to provide a crystal growing apparatus with a high level of safety with an increased pulling rate by a cooler.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill might reasonably infer from the teachings. In re Opprect 12 USPQ 2d 1235, 1236 (CAFC 1989); In re Bode 193 USPQ 12; In re Lamberti 192 USPQ 278; In re Bozek 163 USPQ 545, 549 (CCPA 1969); In re Van Mater 144 USPQ 421; In re Jacoby 135 USPQ 317; In re LeGrice 133 USPQ 365; In re Preda 159 USPQ 342 (CCPA 1968).

Japanese Publication 05-194073 is being cited specifically because it teaches a vertical crucible for producing single crystals wherein a slit heater (11) is in the neighborhood of an InP single crystal seed (13) set to the bottom of the crucible and simultaneously controlling a heat sink (14) equipped with a pipe (15) for a cooling medium.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felisa Hiteshew whose telephone number is (571) 272-1463. The examiner can normally be reached on Mondays through Thursday from 5:30 AM to 4:00 PM with Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mikhail Kornakov, can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-1463.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system. see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866- 217-9197 (toll-free).

/Felisa C. Hiteshew/
Primary Examiner, Art Unit 1792